

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Simpson et al.

Serial No.: 10/813,365

Filed: March 30, 2004

For: X-RAY TUBE FOR A COMPUTED
TOMOGRAPHY SYSTEM AND
METHOD

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§ Confirmation No. 4687
§ Group Art Unit: 2882
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§ Examiner: Song, Hoon K.
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§ Atty. Docket: GERD:0104/YOD/RAR
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August 13, 2007

Date

/John Rariden/

John M. Rariden

REPLY BRIEF PURSUANT TO 37 C.F.R. §41.41

This Reply Brief is being filed in response to the Examiner's Answer mailed on June 13, 2007.

Appellants file this Reply Brief to address certain statements made by the Examiner in the Examiner's Answer. First, Appellants will address the Examiner's statements regarding the first ground of rejection in the Response to Argument section of the Examiner's Answer. Second, Appellants will address certain statements made by the Examiner in regards to the third ground of rejection in the Response to Argument section of the Examiner's Answer.

With regard to the first ground of rejection, the Examiner admits that the combination of the three references (the Carlson '447, the Chidester, and the Carlson '340 references) do not show the recited features of claims 1 and 7, namely, they do not show the recited insulator located on the same side of the target as the motor rotor system. Examiner's Answer, p. 7, lines 14-18. Nevertheless, the Examiner takes the position that the various recited references do not need to show all of the claimed features as the present rejection is formulated under 35 U.S.C. § 103(a). *Id.*, p. 7, lines 20-22. In particular, the Examiner states that "[a]lthough Carlson '447 fails to specifically teach an insulator that insulates cathode, the skilled artisan would have recognized that an insulator must be utilized, otherwise the cathode would short to ground via the metal housing rendering the x-ray tube inoperable." *Id.*, p. 8, lines 3-6.

However, as noted in the previously filed Appeal Brief, the Examiner's rationale and modification appear to be entirely at odds with the actual teachings of the Carlson '447 reference. In particular, the Carlson '447 reference states that "the x-ray tube 12 may be configured with a bipolar arrangement since neither of the bearings 90a, 90b of the straddle bearing assembly 68 are directly exposed to the electric field of the cathode assembly 55 and therefore additional electrical insulation with respect to the cathode assembly 55 is not necessary." Carlson '447, col. 9, line 66 to col. 10, line 4 (emphasis added). In other words, the Examiner has taken a position which appears to be directly contrary to the stated advantages gained by the Carlson '447 design and has declared his modifications to be "obvious" despite being, to all appearances, conflicting with the teachings of the Carlson '447 reference. In short, the Appellants do not believe that one of ordinary skill in the art would review the teachings of the Carlson '447 reference and think to modify it in the manner suggested by the Examiner, in apparent contradiction to the actual teachings of the Carlson '447 reference.

Further, the Examiner goes on to argue that the teachings in the background of the Carlson '447 reference disclose the need for electrical insulation between various tube components. Examiner's Answer p. 9, lines 19-21 (emphasis added). In context however, and particularly in view of the discussion noted at col. 9 line 65 to col. 10, line 4, it appears clear that the discussion in the Background of the Invention, which the Examiner is relying upon, describes part of the problem to be solved by the invention of the Carlson '447 reference, i.e., the need for significant insulation between tube components. Carlson '447, col. 1, lines 33-41. Conversely, the disclosure referenced by Appellants at col. 9, line 65 to col. 10, line 4 appears to describe how the Carlson '447 reference had addressed the problem described in the Background, i.e., by removing the need for insulation. Therefore, it appears incongruous to the Appellants that the Examiner would simultaneously rely upon the state of the prior art described in the Background of the Carlson '447 reference and the description of how the Carlson '447 reference solves the insulation problem as set forth in the Detailed Description of the Carlson '447 reference. Appellants' belief as to the error of the Examiner's positions is reinforced upon review of the figures and the related discussion of the Carlson '447 reference which, despite demonstrated knowledge of insulators in the Carlson '447 reference, do not depict such insulators in the inventive X-ray tube of Carlson '447. Carlson '447, Figs. 2-4; col. 1, lines 33-41; col. 6, line 39 to col. 11, line 38; col. 9, line 65 to col. 10, line 4. Such demonstrated knowledge in the Background coupled with the notable absence of such insulation in the figures and Detailed Description is more supportive of Appellants' position, i.e., that such insulation was not needed and therefore not obvious, than of the Examiner's position, that such insulation, though known of by the inventor's of the Carlson '447 reference, was needed but not described.

With regard to claim 14 as rejected under the first ground of rejection, the Examiner agrees that the combination of the Carlson '447 and Carlson '340 references fail to teach at least two duplex bearing assemblies straddling the target." Examiner's Answer, p. 8, lines 12-15. However, in continuing to maintain the present rejection, the Examiner states that "[a] duplex bearing assembly comprise[s] a pair of bearings, which

reduce the stress load on each of the bearings. Consequently, a duplex bearing assembly will have a longer service life than a single bearing.” Examiner’s Answer, p. 10, lines 8-11.

The Appellants respectfully take issue with the Examiner’s over simplification of the issue at hand. In particular, other factors, particularly the size and composition of the bearings are all factors in the stress load present on a bearing assembly. The simple statement that providing a duplex bearing assembly decreases stress load, without taking into account the probable reduction in bearing size (and corresponding increased contact and wear) to accommodate an additional bearing assembly, is entirely disingenuous. Further, the Examiner’s single line of reasoning as to the benefits of duplex bearings entirely neglects reasons not to employ duplex bearings in the Carlson ‘447 reference which would render such a modification non-obvious. Namely, such disincentives include increased complexity, size constraints associated with a second bearing assembly, and increased failure rate due to an increase, i.e., a doubling, in the number of bearings which can fail and, thereby, require replacement of the entire bearing assembly or X-ray tube itself. In other words, the simplistic representation as to the benefits of using a duplex bearing assembly, without taking into account negatives related to failure rate and to size and complexity constraints is not compelling. Indeed, as noted in the previously filed Appeal Brief, the questionable motivation and analysis provided by the Examiner (which deviates from the Carlson ‘340 reference’s own teaching of using lubricants to assure long life) smacks of hindsight analysis implemented solely to denigrate the present claims based on what is taught in the present application. Carlson ‘340, col. 4, lines 58-61. As previously noted, such hindsight analysis is improper.

With regard to the third ground of rejection, the Examiner argues that the present recitations of claims 19 and 21 only require rotating the gantry at speeds greater than three revolutions per second. Examiner’s Answer, p. 11, lines 13-14. And that “this limitation encompasses all rotation speeds including rotating speeds that are only slightly greater than three revolutions per second, 3.00000001 revolutions per second being an

example. *Id.*, p. 11, lines 14-17. While the Appellants do not disagree with the characterization of the scope of claims 19 and 21, the McCarthy reference simply does not teach these rotation speeds, even rotation at 3.00000001 revolutions per second. Instead, as Appellants have previously noted, the McCarthy reference, in what appears to be its only mention of rotation speed, states that “the gantry 12 is rotated about the gantry axis at a rate of, for example, about two-three revolutions per second.” McCarthy, paragraph 27. On its face, this teaching simply does not render obvious the subject matter of rotating a gantry at speeds greater than three revolutions per second. Further, one skilled in the art would not read the plain teaching of the McCarthy reference and believe that rotating a gantry at speeds greater than three revolutions per second was obvious in view of the range of rotation speeds taught by the McCarthy reference.

The Examiner has argued that the term “about” “has been held to be a broad and flexible term having a meaning similar to “approximately” and “nearly.” Examiner’s Answer, p. 11, lines 19-20. The term “about”, however, is not recited in the present claims as modifying the subject matter of rotational speed. While Appellants agree that there is caselaw so holding with respect to the use of the term “about” in interpreting claims, Appellants are aware of no such caselaw with respect to this term in evaluating the teachings of a reference employed by the Examiner. Unfortunately the Examiner has failed to provide any citation supporting the Examiner’s position with regard to broadening the teachings of a reference past the plain language of the reference itself. As the Board will appreciate, while claim construction is an area where certain words, such as “comprising”, “substantially”, “consisting essentially of”, and “about” have been given special significance, that does not mean that use of these terms in a reference necessarily invokes this significance or breadth.

Instead, as previously discussed in the Appeal Brief, the rate of gantry rotation disclosed by McCarthy is in the range of 2-3 revolutions per second. McCarthy, paragraph 27. Appellants respectfully assert that one would be motivated to rotate the Gantry of the McCarthy reference at greater than three rotations per second only if the

gantry is capable of being rotated at the recited speed, i.e., there can be no motivation to rotate the gantry faster than it is capable of being rotated and functioning. The Examiner has produced no evidence that the gantry of the McCarthy reference can indeed be rotated and function at greater than three rotations per second and the McCarthy reference itself does not contain such a teaching but instead teaches a range of lower rotational speeds. Indeed, the McCarthy reference discloses a *range* of revolutions per second and it is reasonable to assume that disclosed range is complete and constitutes the intended limits at which the McCarthy gantry is capable of rotating. Otherwise, one would expect that the McCarthy reference would have disclosed a broader range (such as 2-4 or 2-5 revolutions per second) which describes the operation of their gantry. Indeed, there is no conceivable reason for the McCarthy reference to disclose an *incomplete range* of intended or operational velocities. The fact that it would be convenient for the Examiner, in view of the claims of the present application, to rotate the gantry disclosed in the McCarthy reference at greater than the disclosed rotational velocity amounts to nothing more than impermissible hindsight analysis on the part of the Examiner, examining the cited reference in view of the presently recited subject matter, not in view of the teachings of the reference. Indeed, there is no indication that the gantry disclosed by the McCarthy reference is physically capable of rotating at velocities higher than those disclosed (see, for example, paragraphs 5-7 of the present application, discussing physical constraints on gantry rotational velocity), nor does the Examiner provide any indication as to why such high speed operation is believed possible of the McCarthy gantry.

Conclusion

Based upon the above points of clarification in conjunction with the arguments made in the Appeal Brief, Appellants believe that the claims are clearly allowable over the cited art. The Examiner's rejections, therefore, cannot stand.

Respectfully submitted,

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